Environmental Protection Agency
U.S. EPA Protecting the Environment - work on HUMAN EXPOSURE TO POLLUTION
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EPA
ORD US EPA Office of Research and Development

1 What we do…
- Observe exposure problems
- Collect real-world samples from people
- Analyze samples
- Study the data
- Find exposure trends
- Create computer models
- Predict future human exposures
- Recommend ways to reduce exposure to pollutants

2 Make Good Observations from…
- Media (TV, Newspaper)
- Medical literature
- Congressional requirements
- Field data
- Human health trends
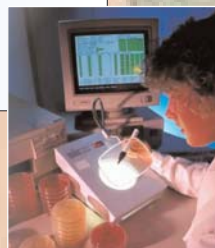- Crises and accidents

3 Analyze Samples

ORGANIC
- Gas Chromatography (GC)
- Mass Spectrometry (MS)
- GC/MS combined

INORGANIC
- Atomic Absorption (AA)

BOTH
- Immunochemistry
- Biosensors

4 Real World Samples
- Indoor air
- Outside air
- "Personal" air
- Food and beverages
- Water (drinking/washing)
- Soil
- House dust
- Blood
- Hair
- Urine

5 Find Exposure Trends
- Dose-response profiles
- Human activity patterns
- Amount and time
- Weight, age, sex
- Geographic location
- Demographics
- Microenvironments
- High-risk groups
- Media (soil, water, air)
- Science and judgment
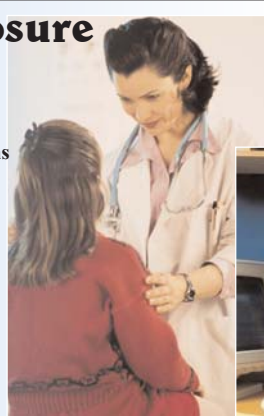
6 Study the problem– get further data
- NHEXAS (National Human Exposure Assessment Survey), a large multiyear multimedia program of related studies
- NHAPS (National Human Activity Pattern Survey)
- NAFTA (North American Free Trade Agreement) and U.S.-Mexico Border Studies
- MNCPES (Minnesota Children's Pesticide Exposure Study)
- NHANES (National Health and Nutrition Study)
- NOPES (Non-Occupational Pesticide Exposure Study)
- TEAM (Total Exposure Assessment Methodology) - several studies
- FQPA (Food Quality Protection Act) – need for goals

7 Making Computer Math Models
- ERDEM (Exposure-Related Dose-Estimating Model)
- QSAR (Quantitative Structure-Activity Relationship) models
- EDTM (Equilibrium Dermal Transfer Model)
- THERdbASE (Total Human Exposure Risk data base and Advanced Simulation Environment) integrated data modeling software system
- BEAM (Benzene Exposure Assessment Model)
- SHEDS (Stochastic Human Exposure and Dose Simulation)
- TEM-MEMWRAP (Total Exposure Model – Multi-Route Exposure Module using Water-Related Activity Patterns)
- Other soil exposure/dose assessments
- Other PBPK (Physiologically-Based Pharmacokinetic) models
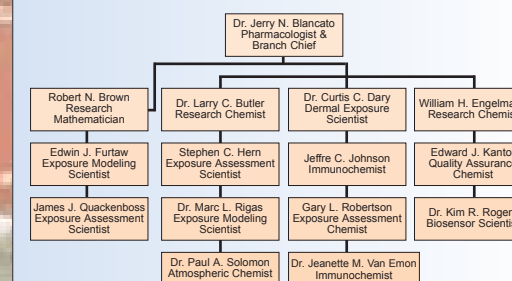
8 Reducing Your Personal Exposure
- Keep home well ventilated
- Keep garage well ventilated!
- Follow product use instructions
- Pesticides away from children!
- Use bathroom fan
- Use stove fan
- Avoid tracking in dirt
- Avoid solvents indoors

9 Predicting Future Human Exposure Using Models

10 Human Exposure Research Branch

Dr. Jerry N. Blancato — Pharmacologist & Branch Chief

Robert N. Brown — Research Mathematician
- Edwin J. Furtaw — Exposure Modeling Scientist
- James J. Quackenboss — Exposure Assessment Scientist

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- Gary L. Robertson — Exposure Assessment Chemist
- Dr. Jeanette M. Van Emon — Immunochemist

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- Dr. Kim R. Rogers — Biosensor Scientist

11 Disclaimer

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